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**Engineering Statement**  
**Digital Replacement Translator Application for KXLY-TV**  
**Channel 22 at Coeur d'Alene, ID**  
**July 2009**

This Engineering Statement has been prepared on behalf of Spokane Television, Inc., licensee of television station KXLY-TV at Spokane, Washington. This material has been prepared in connection with an application for a digital replacement translator ("DRT") to provide continued service to KXLY-TV viewers in the vicinity of Coeur d'Alene, ID.

KXLY-TV has historically operated on low-VHF Channel 4. The station's move to post-transition operations on high-VHF Channel 13 has resulted in a loss of indoor reception service to viewers in the vicinity of Coeur d'Alene. Oded Bendov, et al, have calculated an equivalent minimum field strength of 90 dBu at 10 meters AGL for indoor digital reception utilizing a set-top non-directional antenna.<sup>1</sup> The 90 dBu contour from the KXLY-TV Ch 13 digital operation encompasses a mere 57,000 persons per the 2000 Census, missing the entire population of Coeur d'Alene. The proposed DRT facility will provide 90 dBu service to 87,000 persons in the vicinity of Coeur d'Alene, ensuring that indoor reception of KXLY-TV will not be permanently lost to those persons.

**I. Allocation Study**

Study has been made of all cochannel and adjacent-channel facilities in the vicinity of the proposed operation, including a detailed Longley-Rice interference study to demonstrate that the proposed operation will not cause interference to any facilities with which contour overlap exists. This study

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<sup>1</sup> "Planning Factors for Fixed and Portable DTTV Reception" by Oded Bendov, Yiyang Wu, Charles W. Rhodes, and John F.X. Browne, IEEE Transactions on Broadcasting, Vol. 50, No. 3, September 2004.

was performed using the SunDTV program from V-Soft Communications and a 1 km grid spacing. The SunDTV program identically duplicates the FCC's OET-69 processing program.

The results of this study indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations, with the exception of K23HT at St. Maries, Idaho. The K23HT licensee has provided a letter consenting to the additional interference.

Based on the this allocation and interference study, and the consent of the K23HT licensee, it is believed that the proposed facility can operate without risk of impermissible interference to other stations.

#### Summary Study

Census data selected: 2000

Post DTV Transition Database Selected

#### TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 07-07-2009 Time: 14:51:50

Record Selected for Analysis

BLOS22D USERRECORD-01 COEURDA ID US  
Channel 22 ERP 15. kW HAAT 656. m RCAMSL 01466 m STRINGENT MASK  
Latitude 047-39-34 Longitude 0116-57-48  
Status APP Zone 2 Border  
Dir Antenna Make usr Model USRPAT01 Beam tilt N Ref Azimuth 0.  
Last update Cutoff date Docket  
Comments  
Applicant

Cell Size for Service Analysis 1.0 km/side

Distance Increments for Longley-Rice Analysis 1.00 km

Not full service station

Facility meets maximum power limit

Azimuth (Deg)	ERP (kW)	HAAT (m)	51.0 dBu F(50,90) (km)
0.0	15.000	761.2	71.1
45.0	15.000	763.7	71.2
90.0	15.000	752.5	71.0
135.0	15.000	673.4	69.3
180.0	15.000	471.4	63.5
225.0	15.000	295.3	55.1
270.0	15.000	757.8	71.1
315.0	15.000	771.6	71.3

Contour Overlap to Proposed Station

Station  
 K23HT 23 ST MARIES ID BLTT20060718AAH

Station inside contour of Digital LPTV station  
 BLOS22D 22 CODURDA ID USERRECORD01

Contour Overlap Evaluation to Proposed Station Complete

LANDMOBILE SPACING VIOLATIONS FOUND

NONE

Proposed facility OK to FCC Monitoring Stations

Proposed facility OK toward West Virginia quiet zone

Proposed facility OK toward Table Mountain

Proposed facility is within the Canadian coordination distance  
 Distance to border = 149.0km

Proposed facility is beyond the Mexican coordination distance

Proposed station is OK toward AM broadcast stations

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Start of Interference Analysis

	Proposed Station			
Channel	Call	City/State	ARN	
22	BLOS22D	COEURDA ID	USERRECORD01	

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
21	K21CC	LEWISTON ID	134.5	LIC	BLTT	-19880525IL
21	K21CA	PLAINS, ETC. MT	151.1	LIC	BLTTL	-19890711II
21	KXLY-TV	COLVILLE WA	123.9	APP	BDRTCT	-20090406ALC
22	K22HD	BUTTE MT	383.3	LIC	BLTTL	-20070611AFW
22	KMMF-LP	KALISPELL MT	203.1	APP	BDISTTL	-20070112ADD
22	K22JB-D	KALISPELL MT	204.1	CP	BDCCDTL	-20070420AAE
22	K59BO	PENDLETON OR	261.1	CP	BDISTT	-20060315AET
22	K69AH	THE DALLES OR	383.5	CP	BDISDTT	-20060330AGF
22	KCPQ	SEATTLE WA	400.2	APP	BDRTCT	-20090603AAV
22	K22BI	WALLA WALLA WA	207.3	LIC	BLTTL	-19900813IG
23	K23IB	BONNERS FERRY ID	118.0	LIC	BLTT	-20070921ADL
23	K23IB	BONNERS FERRY ID	118.0	CP	BDFCDTT	-20081002AAY
23	K23HT	ST MARIES ID	52.9	LIC	BLTT	-20060718AAH
24	K24DW	SANDPOINT ID	77.3	LIC	BLTT	-19950608IC
26	K26CK	CRAIGMONT, ETC. ID	180.8	LIC	BLTT	-19890921IH
26	K26DD	KALISPELL MT	203.1	STA	BSTA	-20020802ABL
26	K26DD	KALISPELL MT	203.1	LIC	BLTT	-19920619JM
26	K26GV	OMAK WA	195.0	LIC	BLTTL	-20050419AAX
29	K29ID	WEEKSVILLE, ETC. MT	161.2	LIC	BLTT	-20080912ABS

%%%

Study of this proposal found the following interference problem(s):

The following station failed the de minimis interference criteria.

22D ID COEURDA USERRECORD01  
ERP 15.00 kW HAAT 656.0 m RCAMSL 1466.0 m  
Antenna usr USRPAT01

Due to interference to the following station and scenario: 1

23N ID ST MARIES BLTT 20060718AAH  
ERP 1.13 kW HAAT 1060.0 m RCAMSL 1780.0 m  
Antenna CDB 999999999999999

Percent new DTV interference without proposal: 0.5 BLTT 20060718AAH  
Percent new DTV interference with proposal: 3.3 BLTT 20060718AAH

The following station failed the de minimis interference criteria.

22D ID COEURDA USERRECORD01  
ERP 15.00 kW HAAT 656.0 m RCAMSL 1466.0 m  
Antenna usr USRPAT01

Due to interference to the following station and scenario: 2

23N ID ST MARIES BLTT 20060718AAH  
ERP 1.13 kW HAAT 1060.0 m RCAMSL 1780.0 m  
Antenna CDB 999999999999999

Percent new DTV interference without proposal: 0.5 BLTT 20060718AAH  
Percent new DTV interference with proposal: 3.3 BLTT 20060718AAH

The following station failed the de minimis interference criteria.

22D ID COEURDA USERRECORD01  
ERP 15.00 kW HAAT 656.0 m RCAMSL 1466.0 m  
Antenna usr USRPAT01

Due to interference to the following station and scenario: 3

23N ID ST MARIES BLTT 20060718AAH  
ERP 1.13 kW HAAT 1060.0 m RCAMSL 1780.0 m  
Antenna CDB 999999999999999

Percent new DTV interference without proposal: 0.5 BLTT 20060718AAH  
Percent new DTV interference with proposal: 3.3 BLTT 20060718AAH

The following station failed the de minimis interference criteria.

22D ID COEURDA USERRECORD01  
ERP 15.00 kW HAAT 656.0 m RCAMSL 1466.0 m  
Antenna usr USRPAT01

Due to interference to the following station and scenario: 4

23N ID ST MARIES BLTT 20060718AAH  
ERP 1.13 kW HAAT 1060.0 m RCAMSL 1780.0 m  
Antenna CDB 999999999999999

Percent new DTV interference without proposal: 0.5 BLTT 20060718AAH  
Percent new DTV interference with proposal: 3.3 BLTT 20060718AAH

## II. NIER Study

OET Bulletin 65 Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01) states in part that:

When performing an evaluation for compliance with the FCC's RF guidelines all significant contributors to the ambient RF environment should be considered. . . For purposes of such consideration, significance can be taken to mean any transmitter producing more than 5% of the applicable exposure limit (in terms of power density or the square of the electric or magnetic field strength) at accessible locations.

As will be demonstrated below, the proposed operation will produce less than 5% of the applicable exposure limit for both controlled and uncontrolled environments. Thus, the proposed facility is categorically excluded from the requirement of further study. Therefore, pursuant to §1.1307(b)(3) of the Commission's Rules no calculations are required for the other FM and TV facilities in the vicinity, and precise calculations are made only with regard to the levels from this proposal.

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\text{mW} / \text{cm}^2) = \frac{33.40981 \times \text{AdjERP}(\text{Watts})}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

*D* is the distance in meters from the center of radiation to the calculation point.

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (135 meters below the antenna radiation center). The worst case power density levels occur at depression angles between 45 and 90 degrees below the horizontal. The

calculations in this report assume a worst-case relative field value of 0.100 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized ERI AL12 antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 150 Watts at depression angles between 45 and 90 degrees below the horizontal. Assuming this power and the shortest distance between the antenna radiation center and 2 meters above ground level (i.e. straight down), the highest calculated power density from the proposed antenna alone occurs at the base of the antenna support structure. At this point the power density is calculated to be  $0.3 \mu\text{W}/\text{cm}^2$ , which is 2.5% of  $347 \mu\text{W}/\text{cm}^2$  (the FCC maximum for uncontrolled environments at the Channel 22 frequency).

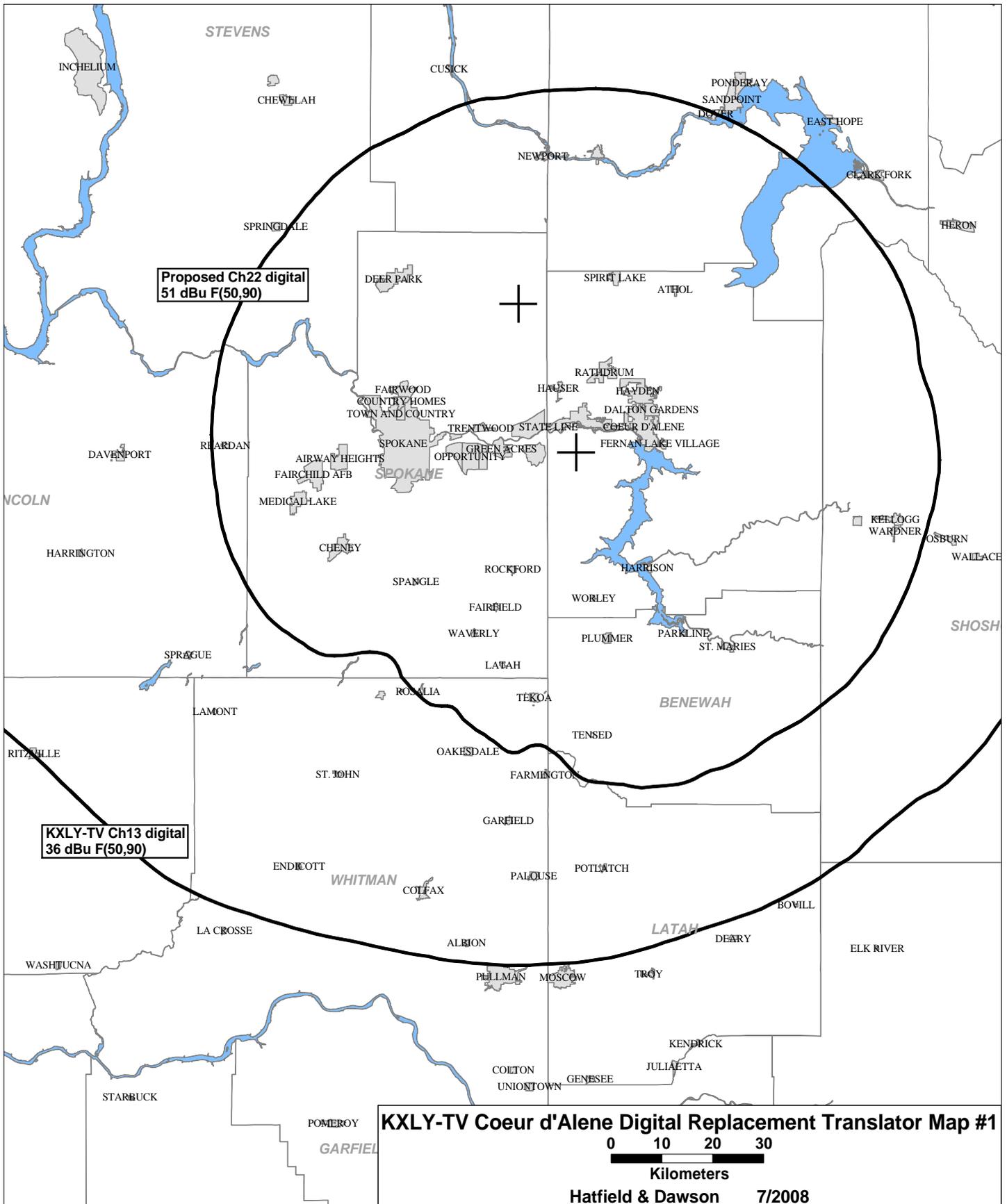
These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 1000 meters from the base of the antenna support structure. Section 1.1307(b)(3) of the Commission's Rules excludes applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicants proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 et seq and no further analysis of non-ionizing radiation at this site is required in this application.

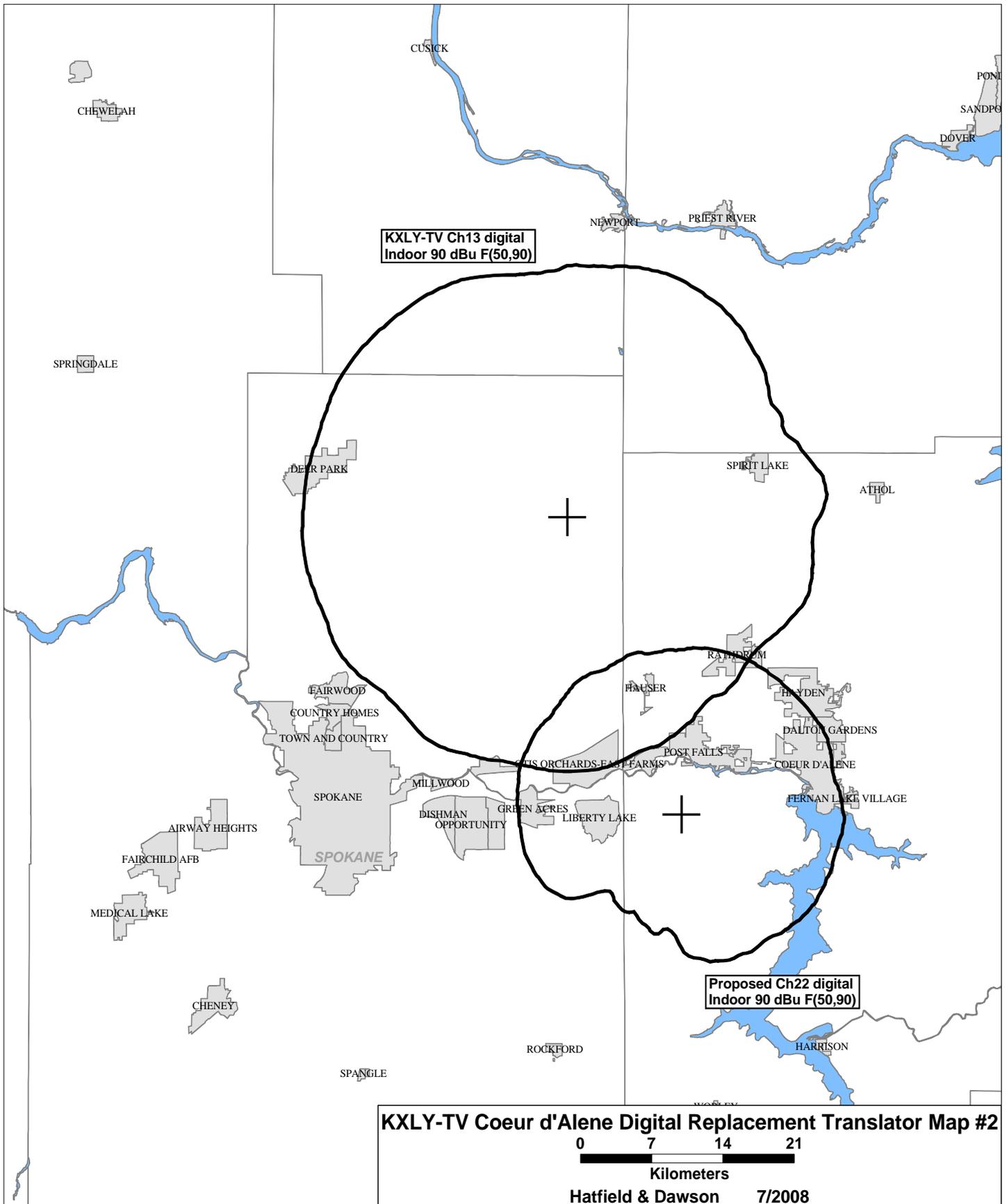
Pursuant to OET Bulletin No. 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced on the antenna tower, including reduction in power or discontinuance of operation before any maintenance work is undertaken. The permittee/licensee in coordination with other users of the site must reduce power or cease

operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency radiation in excess of FCC guidelines.

July 13, 2009

Erik C. Swanson, P.E.





CHEWELAH

CUSICK

PONTIAC

SANDPOND

DOVER

NEWPORT

PRIEST RIVER

**KXLY-TV Ch13 digital  
Indoor 90 dBu F(50,90)**

SPRINGDALE

DEER PARK

SPIRIT LAKE

ATHOL



FAIRWOOD

COUNTRY HOMES

TOWN AND COUNTRY

SPOKANE

SPOKANE

AIRWAY HEIGHTS

FAIRCHILD AFB

MEDICAL LAKE

CHENEY

SPANGLE

HAUSER

RAVENDALE

HYDEN

DALTON GARDENS

COEUR D'ALENE

FERNAN LAKE VILLAGE

WILSONS ORCHARDS-EAST FARMS

POST FALLS

DISHMAN OPPORTUNITY

GREEN ACRES

LIBERTY LAKE



ROCKFORD

HARRISON

**KXLY-TV Coeur d'Alene Digital Replacement Translator Map #2**

0 7 14 21

Kilometers  
Hatfield & Dawson 7/2008